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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/192,674	11/16/1998	DANIELE BAGNI	PHN-16.762	1092

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P.O. BOX 3001
BRIARCLIFF MANOR, NY 10510

EXAMINER

CHEN, WENPENG

ART UNIT PAPER NUMBER

2624

DATE MAILED: 11/14/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/192,674

Applicant(s)

BAGNI ET AL.

Examiner

Wenpeng Chen

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 10/27/2006.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-9 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-9 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 10/27/2006 has been entered.

Examiner's responses to Applicant's remark

2. Applicant's arguments, filed on 9/12/2006 and entered on 10/27/2006 with regard to Claim 1 have been considered but are moot in view of the new ground(s) of rejection due to Applicant's amendments.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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4. Claims 1-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ng (US patent 5,146,325 cited previously) in view of de Haan et al. ("True-Motion Estimation with 3-D Recursive Search Block Matching," de Haan, G et al., IEEE Trans. On Circuits and Systems for Video Technology, vol. 3, No. 5, October 1993, pages 368-379 cited previously) and Kikuchi (US patent 5,713,840 cited previously).

Ng teaches a device and method for coding and decoding comprising the following means and corresponding steps for:

-- estimating (ME) first motion vectors (MV c, MV l, MV r, MV a, MV b) *associated with a set* of first objects of a fixed size of (16*16) pixels, said motion vectors MV l, MV r, MV a, MV b being associated with first objects adjacent to the first object associated with the MV c motion vector; (Fig. 6; column 5, lines 39-64; The objects are the macroblocks of 16 x 16 size. The series of pictures associated with the odd field is itself a series of "frames" to be coded with the MPEG protocol. During motion compensation process, motion vectors of all the macroblocks are derived. For a given macroblock, it has a motion vector. Also each of its adjacent macroblocks has its own motion vector.)

-- generating prediction errors in dependent on the motion vectors associated with the second objects of size (8*8) pixels, being smaller than the first objects; (column 5, lines 39-64; The blocks are the second objects having 8 x 8 size. The residues are the prediction errors.)

-- combining (VLC) the first motion vectors and the prediction errors; (column 7, lines 44-61)

-- generating (VCL⁻¹) first motion vectors (MV c, MV l, MV r, MV a, MV b) and prediction errors from input stream, the first motion vectors (MV c, MV l, MV r, MV a, MV b)

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relating to the first objects of a fixed size, and said motion vectors MV_l , MV_r , MV_a , MV_b being associated with first objects adjacent to the first object associated with the MV_c motion vector; (elements 306 and 308 of Fig.5; column 10, line 62 to column 11, line 23)

-- generating an output signal in dependence on the prediction errors and the motion vectors associated with the second objects having a fixed size smaller than said first objects fixed size; (column 10, lines 31-61;)

-- means for receiving a motion-compensated, predictively-encoded image signal; (column 10, line 58 to column 11, line 12, The signal inputted to VLD 308 is the signal.)

-- means for displaying the decoded image signal. (column 9, lines 33-57)

However, Ng does not teach (1) the filtering steps (MVPF) and (2) using the second motion vectors only for generating prediction errors.

The de Haan paper teaches filtering steps comprising:

-- filtering (MVPF) every occurrence of the first motion vectors (MV_c , MV_l , MV_r , MV_a , MV_b) to obtain second motion vectors (MV_1 , MV_2 , MV_3 , MV_4) for second objects, the second objects being smaller than the first objects ($1/4$ of the first object); (section VII in pages 373-374)

- providing x and y motion vector components of a given macroblock (MV_c) and of macroblocks (MV_l , MV_r , MV_a , MV_b) adjacent to the given macroblock (MV_c); (section VII in pages 373-374; Eq. (33))

- supplying for each block (MV_1) of a number of blocks (MV_1 , MV_2 , MV_3 , MV_4) corresponding to the given macroblock (MV_c), x and y motion vector components respectively selected from the x and y motion vector components of the given macroblock

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(MVc) and from the x and y motion vector components of two blocks (MVl, MVa) adjacent to the block (MV1). (section VII in pages 373-374; Eq. (33); Fig. 7)

-- using only the obtained second motion vectors (MV1, MV2, MV3, MV4) of the second objects for motion compensation to reduce visible block structures. (first paragraph in section VII)

It is desirable to reduce visible block structures in coding and decoding an image signal. It would have been obvious to one of ordinary skill in the art, at the time of the invention, to add de Haan's filtering processes for motion vectors in Ng's method and system, in which the second motion vectors are obtained from the first motion vectors, because the combination provides a better quality of decoded images by reducing blockiness. The combination of Ng and de Haan thus teaches:

-- obtaining second motion vectors (MV1, MV2, MV3, MV4) for second objects (8*8), from the first motion vectors (MVc, MVl, MVr, MVa, MVb) and

-- the prediction errors depend on the second motion vectors.

Because the Ng's decoding process is a reverse process of its own coding process, it would be obvious to one of ordinary skill in the art, at the time of the invention, in the decoding process to add the following feature already discussed above to implement the decoding process:

-- filtering every occurrence of the first motion vectors (MV c, MV l, MV r, MV a, MV b) using a set of motion vectors including the first motion vectors to obtain second motion vectors (MV 1, MV 2, MV 3, MV 4) for second objects, the second objects being smaller than the first objects.

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Because the filtering process is for the purpose for reducing visible block structures with block erosion, the filtering is applied to every occurrence of the first motion vectors and only the filtered motion vectors of the smaller blocks are used for motion compensation.

However, the combination of Ng and de Haan does not teach the feature related to "providing an indication" recited in Claim 1, 3, 4, 6, and 9.

Kikuchi teaches a device and method comprising:

-- generating prediction errors based on a first motion vectors and a second motion vectors; (Figs. 1, 5, 25, 28, and 33A and passages explaining the figures; column 11, lines 8-25 and 37-52; column 46, lines 18-65; column 31, lines 1-63; First and second motion vectors are associated with non-divided and divided regions, respectively.)

-- providing an indication that prediction errors are in dependence upon a second motion vectors. (column 31, lines 1-63; column 32, lines 20-25; column 42, lines 44-55; Any of flags 725, 816, and 826 is the indication.)

It is desirable to accurately and efficiently decompress compressed data adaptively coded with different block size. It would have been obvious to one of ordinary skill in the art, at the time of the invention, to apply Kikuchi's teaching to provide flag (indication) whether divided blocks are used for generating prediction error or not in the system/method taught by the combination of Ng and de Haan, because the overall combination provides a more accurate and efficient decompression. The overall combination thus teaches:

-- providing an indication said prediction errors are in dependence upon said second motion vectors..

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Conclusion

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Wenpeng Chen whose telephone number is 571-272-7431. The examiner can normally be reached on 8:30 am - 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew Bella can be reached on 571-272-7778. The fax phone numbers for the organization where this application or proceeding is assigned are 571-273-8300 for regular communications and 571-273-8300 for After Final communications. TC 2600's customer service number is 571-272-2600.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 571-272-2600.

Wenpeng Chen
Primary Examiner
Art Unit 2624

November 9, 2006

